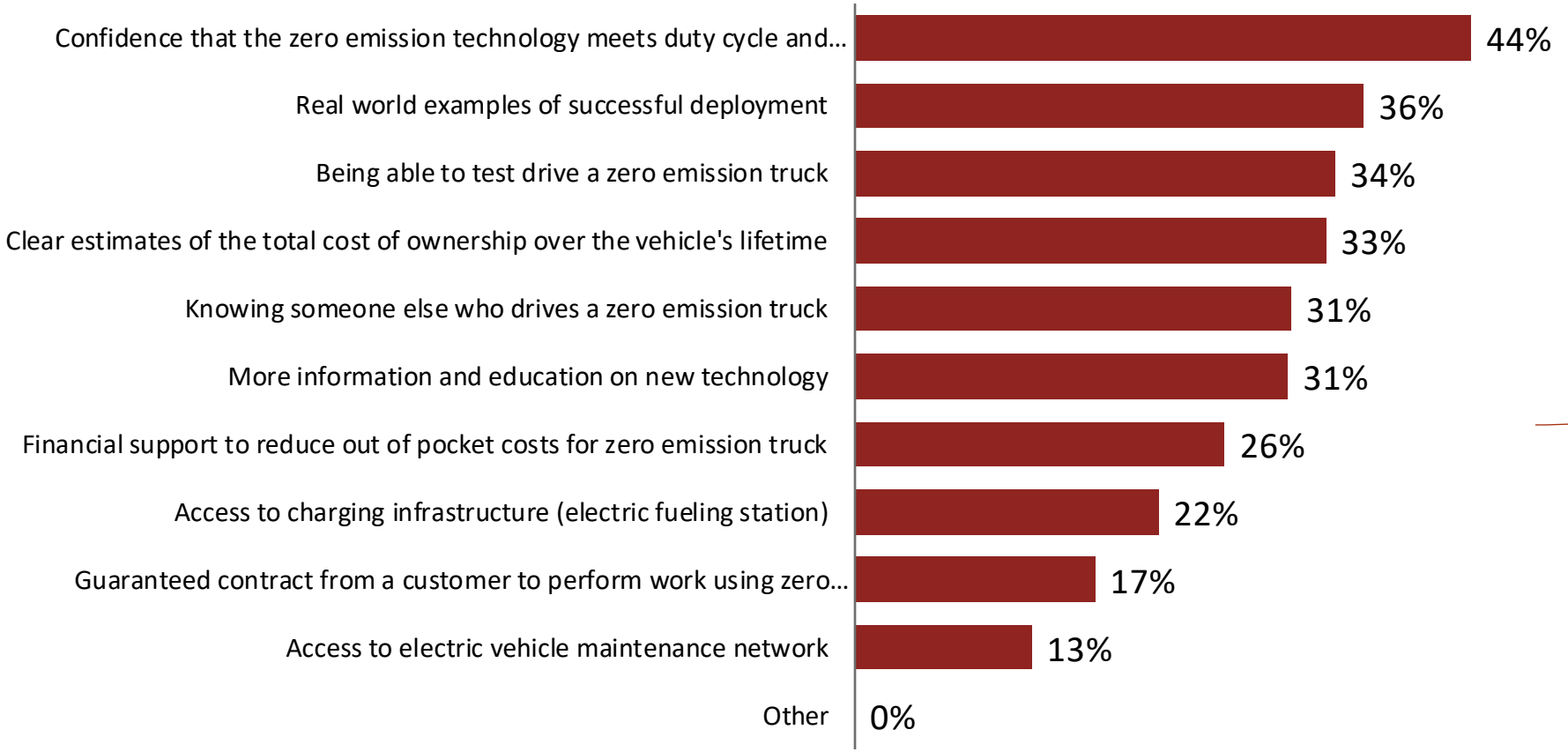
Advice and Insights on Switching to Zero-Emissions Vehicles

What is CFA?

CAL FLEET ADVISOR

What Assistance is Needed?

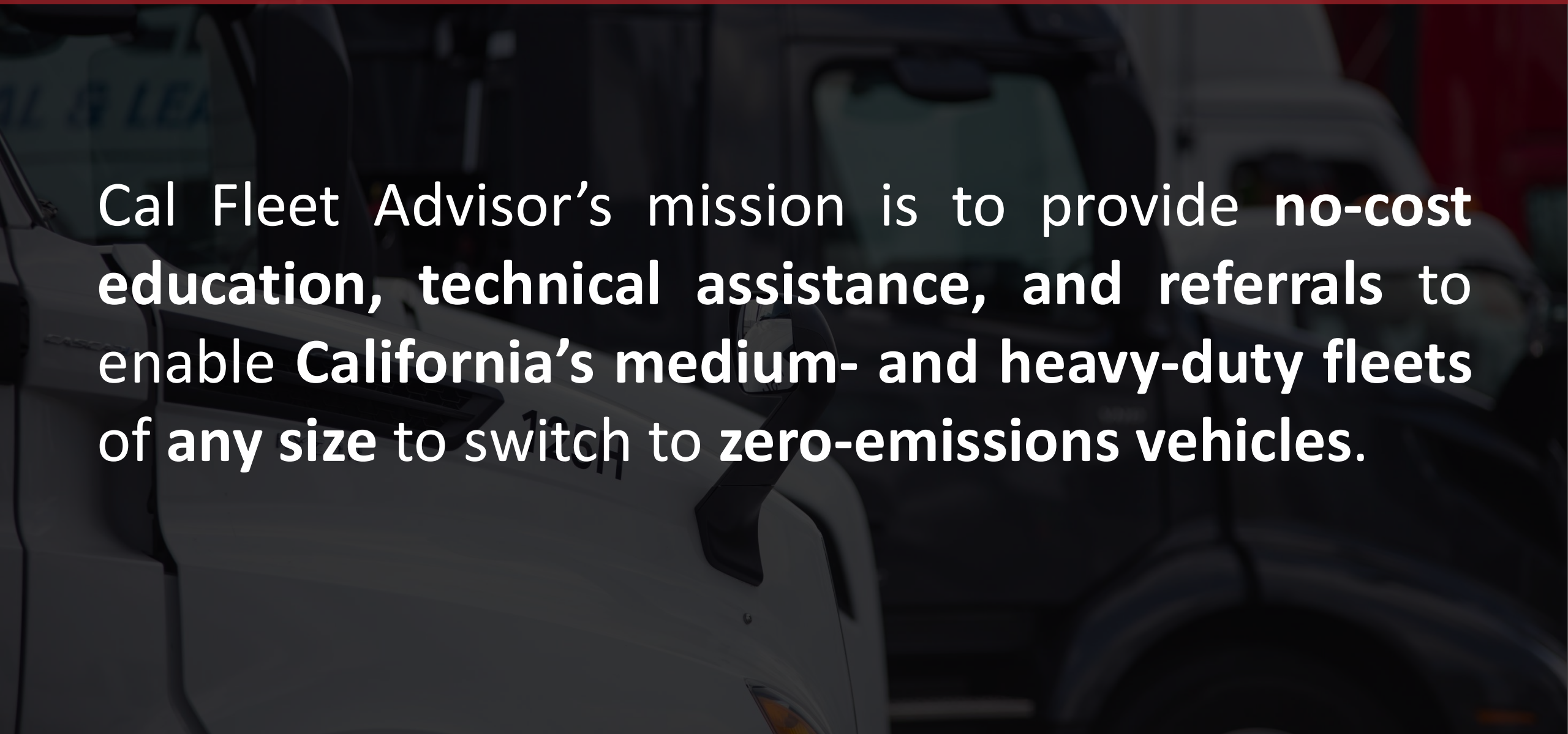
Over 400 small fleets were asked "which of the following would help you feel more comfortable adopting a zero-emission truck? The results:



CFA educational content and concierge services address small fleets top 6 barriers to ZET adoption

Source: March 2022 the NGO Dream Corps Green for All published a report that focuses on the role that small fleets play in the Zero-Emission Trucks (ZETs) transition. Green for All evaluates 446 digital survey responses from small fleets

Cal Fleet Advisor Mission



Cal Fleet Advisor's mission is to provide **no-cost education, technical assistance, and referrals** to enable **California's medium- and heavy-duty fleets** of **any size** to switch to **zero-emissions vehicles**.

Cal Fleet Advisor

- Administered by CALSTART on behalf of CARB
- Funded by HVIP
- Provide Technical Assistance to all California MHD fleets
- Prioritize small fleets, drayage, and disadvantaged communities
- Collaborative approach to fleet assistance – learn about fleet needs and provide fleet-specific advice

How We Help

- **Provide** concierge-style assistance to help fleets overcome electrification challenges
- **Address** fleet's specific needs – not a one-size-fits-all approach
- **Focus** on straightforward solutions to stated issues
- **Apply** lessons to future fleet assistance
- **"Everything they need, and nothing they don't."**

Who We Serve

- Any on-road medium- or heavy-duty commercial fleet in California
  - 8,500lbs-82,000lbs
- Currently working with fleets from 0 trucks to 52,000
- Includes trucks, vans, and buses
  - Now with 100% more school bus!
- Emphasis on small fleets <20 and Disadvantaged Communities (DAC)

Excluded:

- Light-duty
- Transit
- Out of State

Benefits to Fleets

- **Gain** an understanding of how they can benefit from switching to ZEVs
- **Access** to financial, infrastructure, and logistical tools that can help the fleet make informed ZEV purchases
- **Learn** from experts in ZEV transition on incentives, technology, and regulations
- Get **quick answers** and referrals to:
  - Dealers
  - Utilites
  - Regulation resources
- **Access** to incentive funding & HVIP guidance

What Cal Fleet Advisor Does Not Do:

- Electrical Engineering/Planning/Permitting
  - We can help with total power needs and level 2 vs level 3 chargers
- Grant Writing
- Regulatory Compliance Determinations
  - Refer to CARB or appropriate agency
- Play favorites
  - Referrals are at fleet request
- Enforce Regulations

How to Use CFA

1. **Fill out** the simple form at calfleetadvisor.org
2. **Talk** about your fleet's needs with your advisor
3. **Get recommendations** for vehicles, charging, and incentives
4. **Ask** for referrals to utilities, dealers, and project partners
5. **Get incentives** tailored to your fleet
6. **Start using your ZEVs and save on fuel, maintenance, and more!**

Getting Started with ZEVS

All Fleets: Best Practices

- Contact utility early
- Use incentive programs before regulatory requirement
  - CARB generally incentivizes proactive steps, not compliance
- Select most cost-effective charging option that still gets the job done
- Review duty cycle - can changes be made to reduce charging/payload/range needs and still meet requirements?
- Check public charging/fueling options
  - Opportunity Charging during driver breaks, loading stops

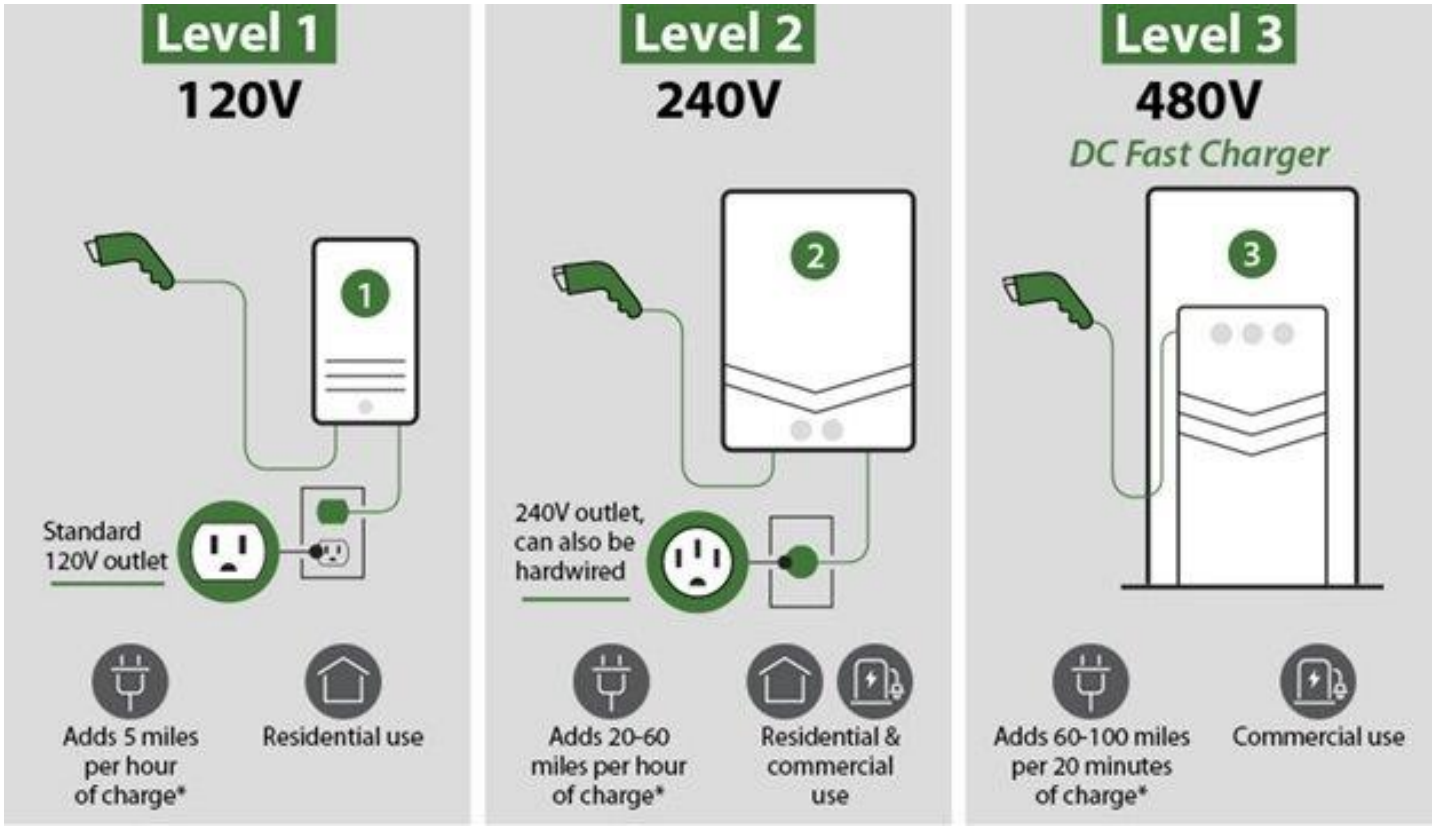
ZEV Fuels
Battery-Electric vs. Hydrogen Fuel Cell

- **Battery Electric MHD Vehicles**
  - Typically weigh more
  - Lower payload capability
  - From 1-10 hrs to charge
  - Typical Range 100-250 miles
  - Less expensive to purchase and fuel than Hydrogen

- **Hydrogen Fuel Cell MHD Vehicles**
  - Weigh more than diesel, but less than BEV
  - Standard payload capability
  - ~20min fueling time
  - Range up to 400 miles
  - More expensive to purchase and fuel
  - Hydrogen sourcing concerns

ZEV Charging Considerations

- Cost
- Power supply (240v/480V)
- Electric rate structure
- Quantity of vehicles
- Time of use
- Sequential vs simultaneous
- Duty Cycle



Graphic from https://www.aedesign-inc.com/blog/2021/9/23/ev-charging-101

Real Life Examples

CAL FLEET ADVISOR

ZEV Duty Cycle Example

- **A fleet required trucks with 500-mile range to pick up monthly loads from a supplier, beyond the range of the battery-electric trucks they were considering.**
  - All other routes were local deliveries
  - Options include:
    - Rent a vehicle once a month
    - 3rd party carriers
    - Acquire a Hydrogen Fuel Cell Vehicle
    - Retain a legacy vehicle for occasional extended-range loads
  - Fleet elected to retain a legacy vehicle, allowing most loads to be ZEV. Legacy vehicle will be replaced when technology allows.

ZEV Adoption Challenge

- **A fleet would like to switch to ZEVs, but their utility cannot provide needed power for level 3 DCFC for 5 years.**
  - Options include:
    - Route analysis - Is DCFC really required, or would level 2 suffice? Total energy usage many not require DCFC speeds.
    - 3rd party charging - Contracting with an outside provider for charging at a publicly accessible facility.
    - Mobile/Temporary charging - Batteries and charging equipment placed on site and swapped at regular intervals.
    - Battery mediated charging – trickle charge batteries with existing connection, then use energy to fast-charge vehicles.
  - Fleet chose to partner with a 3rd party charging service.

ZEV Availability

- **A fleet uses Class 3 pickup trucks with ladder racks as maintenance vehicles and cannot find a ZEV equivalent on the market.**
    - Options include:
        - Move to a class 4+ ZEV with a utility body upfit
        - Wait for vehicles to become available
        - Switch to van bodies instead of pickups
        - Keep existing vehicles
- Fleet elected to switch to vans, saving on operational costs allowing for additional security

ZEV Charging

- **A fleet wants to buy 5 ZEV delivery vans. How much power will they need?**
  - Vans each have 100kwh batteries and drive 50 miles per day
  - Assuming .625kWh/mile, they will consume ~31kWh each per day
  - Level 2 chargers for this van charge at 11kW
  - Charging all 5 vans at the same time would take ~3hrs and 55kW (about 250 amps at 220v)
  - Charging 2 vans at a time would take ~9 hours and 22kW (about 100 amps at 220v)
  - Level 3 charging at 50kW would take ~ 1 hour and 250kW (about 520amps at 480v)

- **Fleet chose to charge 2 vans at a time with smart chargers**
  - No electrical upgrades needed
  - Assuming $0.30/kWh electric rates, fuel costs of $0.19/mile or $9.50/day
  - 15mpg diesel at $4.50/G would be $0.30/mile or $15/day

Resources for Switching

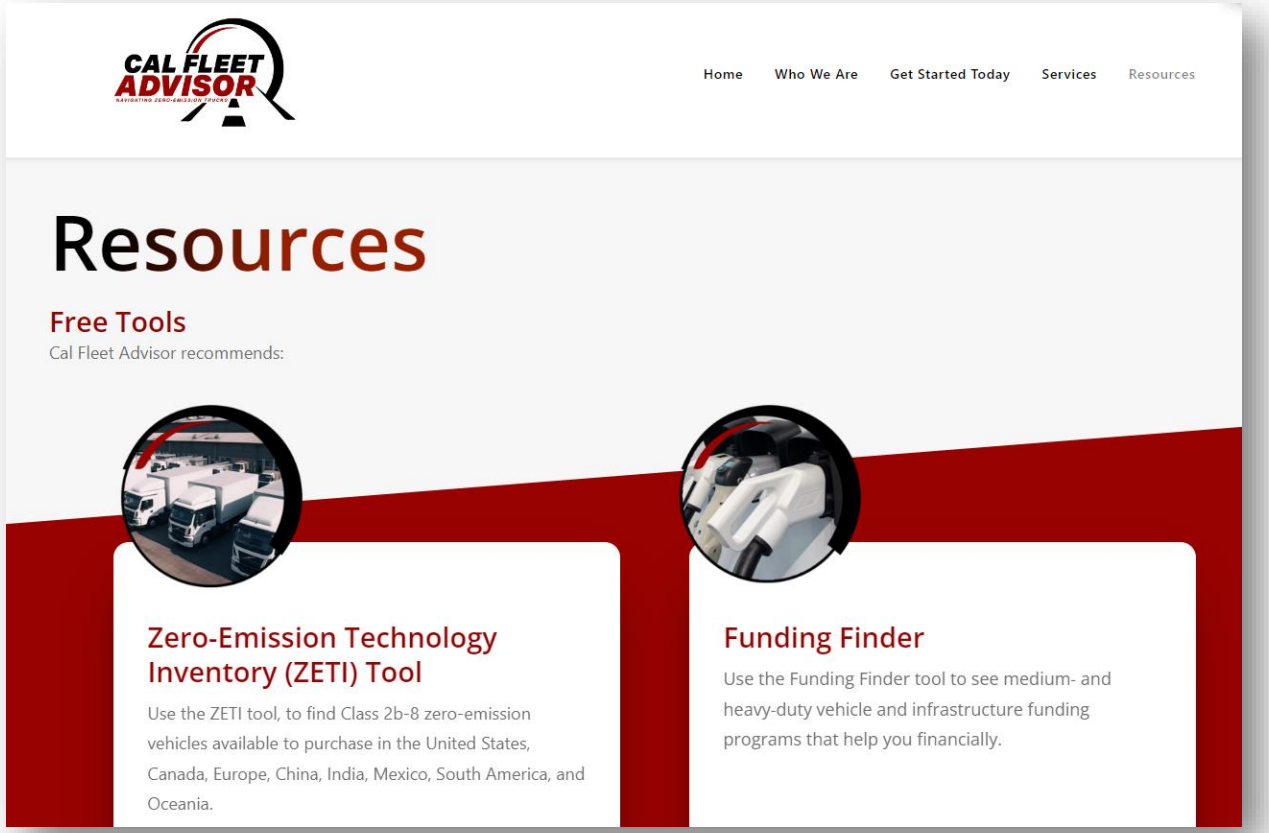
CAL FLEET ADVISOR

Popular Incentives

- **HVIP/ISEF**
  - “Cash on the hood”
  - Increased amounts for small fleets, DAC, drayage, and more
- **Carl Moyer**
  - Requires scrapping older diesel vehicle
  - Administered by AQMD
- **VW Diesel Fund**
  - Requires scrapping older diesel vehicle
  - Stackable with HVIP
- **Tax Credits**
  - Commercial clean vehicle credit up to $40k
  - Up to 30% for infrastructure
  - Direct pay for municipalities
- **Funding Finder**

Resources

- HVIP Vehicle Catalog
- ZETI Tool
- TCO Tool
- PG&E MSRP List
- SCE DRPEP Tool
- Funding Finder
- CARB Regulatory Resources



Access a suite of resources at: https://calfleetadvisor.org/resources/

Q&A

Scan Here to enroll at **no-cost** today!

CAL FLEET ADVISOR

www.CalFleetAdvisor.org

888-TRY-A-ZEV (888-879-2938)

CalFleetAdvisor@CaliforniaHVIP.org